

FINAL PROJECT REPORT

SOUTH FORK ROAD EROSION REDUCTION

Cooperative Agreement # 113339J025

Cooperator:

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1. ABSTRACT:

The South Fork Road Erosion Reduction Project resulted in the successful 'storm-hardening' of 14.4 miles of highly erosive roads with a history of sediment delivery to important habitat for both anadromous salmonid and resident trout. Of this total, 1.9 miles of heavily damaged and/or segments not needed for future access by landowner, Fruit Growers Supply Co., were decommissioned, stabilized and abandoned. Total project costs were \$88,282; with 92 percent of this going directly for road repairs. Equipment use (including operators) accounted for 74 percent and materials for 18 percent. The balance was spent in project development, layout, permits and reporting. The R.C.D. project management expenses were \$7,797. Priorities for road rehabilitation were identified using an area-wide road erosion inventory, funded by Fruit Growers and Timber Products Co., and implemented by Northern California Ecosystem Training Center (NORCET). This project is only one in a series of road upgrading efforts by Siskiyou Resource Conservation District within high-risk older upland road networks. Fruit Growers Co. has been our most frequent partner. The Scott River Ranger District of the Klamath National Forest was an active cooperator and consultation was provided by the Land Committee of the Scott River Watershed Council. 50 individual drainages or crossings were treated and stabilized. Methods employed included road reshaping and outsloping; removal of outside berms and construction of rolling dips; the removal or resizing of nonfunctional culverts; cleaning, excavation of inlets and outlets and rock armoring of culverts; construction and armoring of rock fords; installation of a flat-car bridge and decking at Fox Creek; waterbarring and outsloping of decommissioned roads; use of barrier cloth to stabilize unconsolidated fill material; excavation of fill to narrow road running surfaces; the application of straw mulch and grass erosion seeding. Photo monitoring stations were installed at five major sites. Monitoring of water quality using the V* method, however, has not been done. This must be a followup action of both the R.C.D. and Council. The implementation of repairs and the degree of cooperation by Fruit Growers were both more than satisfactory. Problems encountered during the project involved: a) A two year time delay in project completion and some very unrealistic early expectations; b) Despite active outreach to a South Fork landowners group by the Watershed Council, only the two industrial timberland companies became project participants; c) Specifications and measureable standards for road repairs were not clearly defined. Either a less experienced or uncooperative operator would have presented a constant problem for project administration; and, d) The aforementioned water quality monitoring has not been done.

2. INTRODUCTION:

Efforts by the Scott River Watershed Council and R.C.D. have involved collaboration with landowners, primarily large timberland firms, to identify and rehabilitate existing upland road systems with the greatest potential for sediment delivery to streams and fish habitat impairment. The South Fork of the Scott River is an obvious candidate because of a history of heavy mining, plus an extensive road system for timber harvest access. Erosion potential is high due to the large proportion of decomposed granite soils and steep terrain.

Participants in the project were Fruit Growers Supply Co. of Hilt, CA and Timber Products Co. of Yreka, CA. Road upgrading and repairs, including decommissioning, was completed by Fruit Growers following an intensive road erosion inventory that identified road systems with the greatest sediment delivery potential and was used to develop a plan of work. Timber Products contributed to the inventory which covered ownership within the entire South Fork drainage, but elected to complete the followup road work outside of the Cooperative Agreement. The inventory was done through Northern California Ecosystem Training Center (NORCET) which focuses on training displaced woods workers in Siskiyou County. The Scott River Ranger District of the Klamath National Forest was a Cooperator. Checkerboard ownership in the South Fork drainage means that the main road systems are designed for access to both private and public tracts, often constructed under cooperative agreements. The Klamath N.F. has completed a similar road erosion inventory process and is beginning to repair and manage high priority roads.

Objectives of this project were:

- a). Landowners inventory road erosion problems and set priorities according to actual or potential volume of sediment delivered to stream channels.
- b). Participating landowner, with input from the Land Committee of the Scott River Watershed Council, make road management decisions based on the inventory, potential impacts and management objectives.
- c). Develop the Plan of Work and implement the road upgrading and erosion reduction, including some decommissioning.
- d). Monitor implementation effectiveness to evaluate the project.

To date the Siskiyou R.C.D. has administered 400 miles of road inventory and 127 miles of road repair/erosion reduction, including decommissioning of 19 miles within the Scott River basin. Fruit Growers Supply Co. has been the most frequent partner in these projects.

3. DESCRIPTION OF STUDY AREA:

The original project study area encompasses roughly 18,000 acres, of which an estimated 60 percent is in public ownership (Klamath National Forest). The Principle private land owners are Fruit Growers Supply Co. of Hilt. CA and Timber Products Co. of Yreka, CA. Road systems identified as highest priority for erosion reduction and rehabilitation by Fruit Growers lie in Sec. 24, 25, 26, 33, 35, and 36, T. 40 N., R. 9 W. Timber Products participated in the erosion reduction inventory phase, but elected to do the followup road repairs and upgrading outside of the Coop. Agreement process.

Streams within the rehabilitation area are 2-1/2 miles of the South Fork of the Scott River, plus the major tributaries Fox and Boulder Creek. These streams are known for their fisheries habitat. Although no hard numbers are available, a USFS survey of several pools in the South Fork and Boulder Cr. during the summer of 1996 showed coho and steelhead juveniles present, averaging 8 steelhead and 12 coho per pool.

Vegetation is primarily Sierra mixed conifer (a variable mix of Douglas-fir, ponderosa pine, white fir, sugar pine and incense-cedar) of moderate site productivity. This is interspersed with montane shrub openings as well as rock and tallus outcrops. Riparian vegetation includes red alder, willow, big-leaf maple and herbaceous species. The area differs from most other sub-watersheds in the Scott Valley in that there is essentially no ranch land.

The area was heavily mined for many years. Presently, the private lands are mainly utilized for timber production and recreation. Project area is known for having decomposed granitic soils, relatively steep terrain and a potential for mass wasting, erosion and sediment delivery to streams.

4. METHODS AND MATERIALS:

The Road Erosion Inventory conducted by NORCET is designed to locate and survey problem erosion sites related to road systems. Sites with current erosion volumes > 10 cu. yds. were documented, inventoried and mapped. An MS Access Database is used to compute past erosion associated with the roads, culverts and crossings. Mass wasting associated with roads is also inventoried. The following items are utilized: 1. A Road Erosion Inventory Road Log; 2. A volumetric Erosion Inventory Form; 3. A Site Sketch and Photo Log; 4. Field Mapping Form; and 5. A Cumulative Photo Log. A GIS map of roads and inventory sites; as well as legal subdivision, ownership

status and drainages is produced. (See Project Map, Appendix A). The road segments are rated based on their potential sediment delivery volumes.

The road sediment reduction work itself is based on the Description and Plan of Work developed by Fruit Growers Supply Co. (Area Forester Tom Shorey and Roads Manager Clyde Franklin), in consultation with USFWS Contract Manager Jennifer Silveira, RCD Project Coord. Mike Schafer and the SRWC Land Committee. The detailed Description of Work Report is attached as Appendix B. Methods of road upgrade and repair included:

- Reshaping and outslowing, removal of outside berms and installation of rolling dips.
- Maintaining existing culverts, and removal or resizing of non-functional culverts.
- Cleaning and excavation of inlets and outlets, and rock armoring.
- Constructing rolling dips and rock reinforcement to improve drainage.
- Narrowing of road running surfaces by the excavation of unconsolidated fill material.
- Installing a bridge and decking at a crossing of Fox Creek.
- Constructing and armoring rock fords to dissipate energy.
- Decommissioning road segments by waterbarring, removing or armoring culverts, outslowing and installing rock fords.
- Applying jute-matting barrier cloth to stabilize one highly erosive fill site.
- Applying straw mulch and a grass seed mix to improve and strengthen site stability.

Refer to Appendix B for the specific miles and number of sites treated and the materials used.

The following equipment, with operators, was used during the project: A D7G Caterpillar with ripper; a 225 Excavator; a 966 Loader; a road grader; and two dump trucks. Mulch was hand applied and a cyclone seeder was used for the erosion seeding. Barrier cloth was hand layed and anchored.

Photo points were installed at five of the major sites and the Fox Creek bridge.

5. RESULTS AND DISCUSSION OF ACCOMPLISHMENT.

(Refer to Appendix B for the detailed breakdown of accomplishment by road segment and individual site repairs). 14.4 total miles of road system were successfully upgraded or decommissioned. Decommissioning and abandonment was done on 1.9 miles of four roads or road segments. 50 individual drainages and crossings were treated. USFWS Project Manager Jennifer Silveira participated in on-site reviews and inspections before, during and after the prioritization process and the implementation of road repairs.

Road Decommissioning: The 1.9 miles included Rd. #1001.8 (1.09 mi.), Rd. #1001.2 (.2 mi.), Rd. # 1003.2 (.11 mi.) and Rd. # 1003.6 (.5 mi.). Methods involved outslowing to improve drainage, waterbar construction at 25-50 ft. intervals, pulling of crossings back to hillslope grade, removal or stabilization of culverts, eliminating outside berms, rolling dips and rock reinforcement, the merging of major drainage sites with trenching and reinforcement, seeding and mulching. Actual road decommission exceeded the .25 miles anticipated during the original Plan of Work. Decisions were based on field reviews and consultation between FGS, RCD and USFWS, as heavily damaged road segments or spurs not serving future company access needs were identified.

Road Upgrading: Upgrading, repairs and the reduction of sediment delivery potential was successfully completed on Rd. # 1001 (4.7 mi.), Rd. #1001.1 (.75 mi.), Rd. # 1001.2 (.5 mi.), Rd. # 1001.3 (.25 mi.), Rd. # 1001.5 (.15 mi.) Rd. # 1001.6 (.15 mi.), Rd. # 1001.7 (.28 mi.), Rd. # 1001.8 (1.09 mi.), Rd. # 1001.9 (.27 mi.), Rd. # 1003 (2.35 mi.), Rd. # 1003.1 (.13 mi.), Rd. # 1003.3 (.52 mi.), Rd. # 1003.4 (.8 mi.), Rd. # 1003.5 (.95 mi.), Rd. # 1003.5A (.9 mi.) and Rd. # 1003.6 (.61 mi.). Treatments included shaping and outslowing of road surface to improve drainage, removal of outside berms, excavation of unconsolidated fill material to narrow road widths, installing and reinforcing rolling dips, cleaning and rocking culvert inlets and outlets, culvert removal or resizing, repair and rocking of inboard ditches above culverts, excavate and create catch basins at inlets, trenching and armoring to merge sites at major drainages, installing safe outlet dips over culverts, rocking to protect unstable fill slopes, constructing rock fords, installing a railroad flat-car bridge at the Fox Creek crossing, laying and anchoring barrier cloth at a highly erosive fill location, mulching and erosion seeding. A large percentage of the equipment and operator time was spent on heavy runoff, double site locations on Rds. #1001.8 and #1003.6; and the Fox Creek bridge installation (site # 1001048). Portions of Rds. #1001.3, #1003.5A and #1001.6 were found during field review to be fully stabilized with functional drainage, and conifer, shrub and herbaceous vegetation well established on the road prism. These segments were left undisturbed.

Problems Encountered During the Project:

A.) Time Delays. The Cooperative Agreement was signed by the R.C.D. on Feb. 4, 1999, with implementation of road improvements to be finished in the fall of 1999 and Final Report completed by Feb. 28, 2000. In hindsight, this was a very unrealistic expectation. The Road Erosion Inventory needed to identify priorities and develop a Work Plan was not available until spring of 2000 and the implementation of road upgrades and rehabilitation begun in mid-summer of 2001. Several requests for time extension were required.

B. Degree of Landowner Participation. Active early outreach was done with a South Fork Landowners Group during development of the Project Proposal. Eventually, only the two industrial timberland companies, Fruit Growers and Timber Products, elected to participate. One extremely active and gully-eroded road segment on Simpson Forest Products ownership ("One of the two worst on the District" according to USFS Hydrologist Jay Power) could not be addressed under this project.

C Lack of Work Specifications. Methods, techniques and standards for road repairs were defined in only very general terms in the Cooperative Agreement and Project Proposal. More clearly defined and measureable specifications for tasks such as rock ford construction, culvert removal or resizing, rolling dips and outsloping, rock armoring, etc. should be included in future projects of this type. Fortunately, Fruit Grower's Road Manager, Area Forester and Road Crew were extremely experienced and able to implement tasks based on verbal instructions and negotiations as the project progressed. With a less experienced or less cooperative operator, however, this would have presented an constant problem for the project administrator.

D. Lack of Water Quality Monitoring. The fourth project objective ('Monitor implementation effectiveness to evaluate the project'.) has received very little attention. Both Fruit Growers and the R.C.D. have established photo point monitoring sites. However, no 'pre and post-project sediment monitoring using the V* method' has been done. The R.C.D. has identified a suitable monitoring site on Fox Creek and hopes to conduct the necessary post-project monitoring over the next five years.

6. SUMMARY AND CONCLUSIONS.

Program Objectives and Tasks (see Coop. Agreement, pg. 1) have been met for the project, with the primary benefit being 14.4 miles of damaged and highly erosive roads in the South Fork area have become 'storm-proofed' through a combination of upgrading and decommissioning. A summary of the six individual tasks is:

1. A landowners group was organized by the Scott River Watershed Council Coordinator to make people aware of the need for road improvements to reduce sediment delivery to this important fishery. Ultimately, only the two large timberland firms participated in the erosion reduction project.

2. The road and site inventory needed for prioritization of road repairs was well coordinated between Fruit Growers Co., Timber Products Co., the USFS-Scott River Ranger District and R.C.D. The methodology used for inventory of the private and public roads is compatible in the sense that major data elements and format allow the information to be merged, if necessary, for any future watershed-wide road system assessment.

3. The Road Erosion Inventory performed by NORCET/Resource Management of Fort Jones proved to be thorough and the data elements well suited to the setting of work plan priorities and needs. The training element was met through employment of several local displaced woods workers. The road inventory methodology and protocol has been an evolving process, and has been employed on subsequent projects within Moffett Creek, Mill Creek and the Etna highlands areas.

4. Identification of priority sites and roads by Fruit Growers was coordinated with the SRWC-Land Committee and USFWS Contract Manager. The implementation plan was reported to the Scott River Watershed Council.

5. The actual road work was delayed until summer and fall of 2001. The quality of work and responsiveness of the FGS Road Manager and crew was very good. There was a willingness to negotiate and respond to the usual on-the-ground surprises, site reworking and schedule adjustments. More road decommissioning and abandonment was actually done (1.9 miles) than had been anticipated in the original plan of work.

6. The cooperative monitoring has been only partially addressed, and needs much followup. Both the R.C.D. and landowner have established photo monitoring sites to evaluate project effectiveness. One major repair, the trenching and reinforcement on a decommissioned segment of Rd. # 1001.8 (sites 1001104 and 105), is considered to be high risk and should be

checked after any major storm event. No water quality monitoring using the V* method has been done, although a stream channel segment on Fox Creek has been identified. This needs followup by both the R.C.D. and Watershed Council.

7. SUMMARY OF EXPENDITURES

(See Appendix B for a detailed summary of costs and expenditures by individual road segment and site). The total project costs were \$88,282.25. The Fruit Growers road inventory conducted by Resource Management was \$4,000. \$2,750 was spent in project development, layout, permit and report preparation by the FGS Area Forester. The Stream Alteration Permit (1603) cost \$154.

The balance, or \$81,378.25, was direct project expense. Equipment time (including operators) for the D7G and pit Caterpillars, excavator, loader, grader, dump trucks expenditures totalled \$65,561.25. This also includes movement of the flat-car bridge and labor for the seeding, mulching, etc. Materials costs were \$15,817. This includes 220 ft. of replacement culverts (12 to 24 in.), rock rip-rap (5,540 cu. yds.), bridge and decking, concrete footing, barrier cloth (5 rolls), straw mulch and grass seed.

R.C.D. project management expenses were \$7,795 (see the Cooperative Agreement, attachment 1a, for a detailed breakdown).

8. SUPPLEMENTAL APPENDICES.

A. PROJECT AND SITE GIS MAP.

B. DETAILED WORK AND COST SUMMARY.

C. PHOTO MONITORING.

APPENDIX B

SOUTH FORK - SCOTT RIVER ROAD SEDIMENT REDUCTION PROJECT FINAL REPORT

The following report details the work completed in the South Fork Scott River Road Sediment Reduction Project on Fruit Growers Supply Company Lands. Project implementation took place in the Summer and Fall of 2001. Several changes were made to the original work plan after more detailed field inspection. Most of these changes involved decommissioning road segments which were originally proposed for road upgrades. Refer to the attached maps for road segment and site locations. All of the soil stabilization costs (seeding and mulching) have been lumped into road segment 1001.

SUMMARY TABLE			
Project Preparation Work			
1603 Permit			\$154.00
Road Inventory- Resource Management			\$4,000.00
Project development, layout, and report writing		50 hrs@\$55.00/hr	\$2,750.00
Subtotal:			\$6,904.00
Road Work			
Road Segment	Distance	Description of work	Total Cost
1001	4.7 miles	Upgrade	\$39,629.00
1001.1	0.75 miles	Upgrade	\$2,997.00
1001.2	0.5 miles	Upgrade	\$595.00
1001.3	0.25 miles		\$0.00
1001.5	0.15 miles	Upgrade	\$416.25
1001.6	0.15 miles	Waterbar	\$90.00
1001.7	0.28 miles	Upgrade	\$1,340.00
1001.8	1.09 miles	Decommission	\$5,090.00
1001.9	0.27 miles	Upgrade	\$845.00
1003	2.35 miles	Upgrade	\$19,051.00
1003.1	0.13 miles	Upgrade	\$885.00
1003.2	0.11 miles	Upgrade	\$520.00
1003.3	0.52 miles	Upgrade	\$5,905.00
1003.4	0.8 miles	Upgrade	\$220.00
1003.5	0.95 miles	Upgrade	\$1,470.00
1003.5A	0.9 miles	Waterbar	\$90.00
1003.6	0.5 miles	Decommission	\$2,235.00
Subtotal:			\$81,378.25
Total:			\$88,282.25

**SOUTH FORK - SCOTT RIVER
ROAD SEDIMENT REDUCTION PROJECT
FINAL REPORT**

ROAD SEGMENT: 1001
LENGTH: 4.7 miles

DESCRIPTION OF WORK:

Upgrade Road

- Reshape road surface for drainage by outsloping, removing outside berms, and installing rolling dips.
- Maintain existing functional culverts. Clean cmp inlets, and outlets. Excavate catch basin at cmp inlets. Install safe outlet dips over cmp's. Rock armor cmp inlets and outlets with sufficient size and quantity of rock to protect fill.
- Upgrade failed or eroded crossings to higher standards.

Site Fixes:

- Site 1001032 – Clean cmp inlet and outlet. Construct dipped safe outlet. Rock inlet & outlet.
- Site 1001034 - Clean cmp inlet and outlet. Construct dipped safe outlet. Rock inlet & outlet.
- Site 100134A – Install 18" cmp. Construct dipped safe outlet. Rock inlet & outlet.
- Site 1001038 - Clean cmp inlet and outlet. Construct dipped safe outlet. Rock inlet & outlet.
- Site 1001039 - Clean cmp inlet and outlet. Construct dipped safe outlet. Rock inlet & outlet.
- Site 1001041 – Repair & clean inlet & outlet. Construct dipped safe outlet. Rock inlet & outlet.
- Site 1001048 (Fox Creek) – Install 55 foot railroad flat car bridge.
- Site 1001056 – Install rock ford with 18" cmp to afford low stream flows.
- Site 1001057 – Install rock ford with 18" cmp to afford low stream flows.
- Site 1001060 - Construct wide shallow rock dip with rock overside.
- *Site 1001095 – Open up existing 24" cmp. Construct rock ford on top of cmp.

COSTS EQUIPMENT & LABOR	Cost / hour	Hours	Cost
CAT-----	\$90.00	22	\$1,980.00
Dump Truck-----	\$55.00	83	\$4,565.00
Excavator-----	\$125.00	72	\$9,000.00
Loader-----	\$65.00	36	\$2,340.00
Pit CAT-----	\$90.00	57	\$5,130.00
Grader-----	\$75.00	9	\$675.00
Move Bridge-----			\$1,500.00
Labor to seed and mulch - Total Project:	\$32.50	34	\$1,105.00
Sub Total:			\$26,295
MATERIALS:			
Railroad Car Bridge-----			\$5,500.00
Bridge Decking-----	\$4.50/ft.	880 ft.	\$3,960.00
Concrete Footing-----	80.00/cyd	3 cyds	\$240.00
Grass Seed – Total Project-----	\$1.97/lb	200 lbs	\$394.00
Straw Mulch-----	\$90.00	36 Tons	\$3,240.00
Rip Rap – 1,700 cyds			
Sub total:			\$13,334.00
TOTAL COST:			\$39,629.00

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ROAD SEGMENT: 1001.1 LENGTH – 0.75 miles			
DESCRIPTION OF WORK: <ul style="list-style-type: none"> • Reshape road surface for drainage by outsloping. • Install (3) rocked rolling dips. • Install (3) culverts. • Reshape and maintain inside road ditches to cmp's – 400 ft. 			
	Cost / hr	Hours	Cost
CAT-----	\$90.00	3	\$270.00
Dump Truck-----	\$55.00	9	\$495.00
Excavator-----	\$125.00	7	\$875.00
Loader-----	\$65.00	1	\$65.00
Grader-----	\$75.00	2	\$150.00
Subtotal:			\$1,855.00
MATERIALS:			
80 ft. – 12" cmp	\$9.00 / ft.		\$720.00
4 Bands	\$8.00 / band		\$32.00
30 ft. – 18" cmp	\$13.00 / ft.		\$390.00
Rock – 60 cyds.			
Subtotal:			\$1,142.00
TOTAL COST:			\$2,997.00

ROAD SEGMENT: 1001.2 LENGTH: 0.5 miles			
DESCRIPTION OF WORK: <ul style="list-style-type: none"> • Reshape road surface for drainage by outsloping, removing outside berms, and installing rolling dips. • Install 2 rocked dips wherer minor intermittent streams cross road. • Decommission last 0.2 miles of road by waterbarring, removing cmp's, outsloping 			
COSTS			
EQUIPMENT & LABOR	Cost / hour	Hours	Cost
CAT-----	\$90.00	3	\$270.00
Dump Truck-----	\$55.00	2	\$110.00
Loader-----	\$65.00	1	\$65.00
Grader-----	\$75.00	2	\$150.00
Subtotal:			\$595.00
MATERIALS:			
Rock – 10 cyds			
30 ft. – 12" cmp			
TOTAL COST:			\$595.00

**SOUTH FORK - SCOTT RIVER
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ROAD SEGMENT: 1001.3			
LENGTH: 0.25 miles			
DESCRIPTION OF WORK:			
<ul style="list-style-type: none"> Field inspections revealed no problem sites. The road is well drained. Regeneration and brush are presently establishing in the road prism. The consensus of all involved parties was that the road should be left as is. 			
COSTS EQUIPMENT & LABOR	Cost / hour	Hours	Cost
CAT-----	\$90.00	0	\$0.00
TOTAL COST:			\$0.00

ROAD SEGMENT: 1001.5			
LENGTH: 0.15 miles			
DESCRIPTION OF WORK:			
<ul style="list-style-type: none"> Reshape road surface for drainage by outsloping, removing outside berms, and installing rolling dips. *Site 1001111 - Construct 50 foot inside road ditch to cmp to dry up seep adjacent to road. Clean existing 18" cmp. Construct dipped rock ford above cmp with rip rap. Construct large catch basin at cmp inlet. 			
COSTS EQUIPMENT & LABOR	Cost / hour	Hours	Cost
CAT-----	\$90.00	1	\$90.00
Dump Truck-----	\$55.00	2	\$110.00
Excavator-----	\$125.00	1	\$125.00
Loader-----	\$65.00	0.25	\$16.25
Grader-----	\$75.00	1	\$75.00
Subtotal:			
MATERIALS:			
Rip Rap - 15 cyds			
TOTAL COST:			\$416.25

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ROAD SEGMENT: 1001.6 LENGTH: 0.15 miles			
DESCRIPTION OF WORK: <ul style="list-style-type: none"> Jeep road. Not field checked. Check for erosion. Waterbar as necessary. 			
COSTS EQUIPMENT & LABOR	Cost / hour	Hours	Cost
CAT-----	\$90.00	1	\$90.00
MATERIALS:			
TOTAL COST:			\$90.00

ROAD SEGMENT: 1001.7 LENGTH: 0.28 miles			
DESCRIPTION OF WORK: <ul style="list-style-type: none"> Reshape road surface for drainage by outsloping, removing outside berms, and installing rolling dips. Site 1001087 - Construct rip rap rock ford with 18" cmp in base to afford low stream flows. Site 1001086 - Clean cmp inlet and outlet. Construct dipped safe outlet. Rock inlet & outlet. 			
COSTS EQUIPMENT & LABOR	Cost / hour	Hours	Cost
CAT-----	\$90.00	1	\$90.00
Dump Truck-----	\$55.00	6	\$330.00
Excavator-----	\$125.00	3	\$375.00
Loader-----	\$65.00	1	\$65.00
Pit CAT-----	\$90.00	2	\$180.00
MATERIALS:			
40 ft. - 18" cmp----- Rip rap - 20 cyds	\$7.50 / ft.		\$300.00
TOTAL COST:			\$1,340.00

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ROAD SEGMENT: 1001.8			
LENGTH: 1.09 miles			
DESCRIPTION OF WORK:			
<ul style="list-style-type: none"> Decommission road – approx. 0.9 mi.. Eliminate outside road berms, and water bar road at 25 to 50 foot intervals. Grass seed road prism. Site 1001100 – 36" cmp. Clean inlet and outlet. Construct large dipped rip rap rock ford on top of cmp. Rock armor inlet and outlet. Excavate large catch basin at cmp inlet. Site 1001102 – Dip and rock crossing. Site 1001103 – Clean 24" cmp inlet and outlet. Construct dipped safe outlet. Rock armor inlet and outlet. Excavate large catch basin at cmp inlet. *Site1001104 & 1001105 – Dipped both crossings substantially below the existing road grade. Merged both crossings with large trenches. Rock armored. Grass seeded site. *Site 1001106 – Seep in Road. Dip crossing. Rock overside 			
COSTS			
EQUIPMENT & LABOR	Cost / hour	Hours	Cost
CAT-----	\$90.00	19	\$1,710.00
Dump Truck-----	\$55.00	9	\$495.00
Excavator-----	\$125.00	21	\$2,625.00
Loader-----	\$65.00	4	\$260.00
Subtotal:			5,090.00
MATERIALS:			
Rip Rap – 300 cyds			
TOTAL COST:			\$5,090.00

ROAD SEGMENT: 1001.9			
LENGTH: 0.27 miles			
DESCRIPTION OF WORK:			
<ul style="list-style-type: none"> Reshape road surface for drainage by outsloping, removing outside berms, and installing rolling dips. Maintain existing functional culverts. Clean cmp inlets, and outlets. Excavate catch basin at cmp inlets. Install safe outlet dips over cmp's,. Rock armor cmp inlets and outlets with sufficient size and quantity of rock to protect fill. 			
COSTS			
EQUIPMENT & LABOR	Cost / hour	Hours	Cost
CAT-----	\$90.00	2	\$180.00
Dump Truck-----	\$55.00	5	\$275.00
Excavator-----	\$125.00	2	\$250.00
Loader-----	\$65.00	1	\$65.00
Grader-----	\$75.00	1	\$75.00
MATERIALS:			
TOTAL COST:			\$845.00

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FINAL REPORT**

ROAD SEGMENT: 1003 LENGTH: 2.35 miles			
DESCRIPTION OF WORK: <ul style="list-style-type: none"> Reshape road surface for drainage by outsloping, removing outside berms, and installing rolling dips. Maintain existing functional culverts. Clean cmp inlets, and outlets. Excavate catch basin at cmp inlets. Install safe outlet dips over cmp's. Rock armor cmp inlets and outlets with sufficient size and quantity of rock to protect fill. Upgrade failed or eroded crossings to higher standards. <ul style="list-style-type: none"> Site 1003003 - 24" cmp. Clean inlet & outlet. Rock armor inlet & outlet. Dip safe outlet over culvert. Rock armor to protect fill. Site 1003003A - 24" cmp. Clean inlet & outlet. Construct rock ford over cmp. Site 1003003B - Gully erosion. Construct rock dip. Rock overside to protect fill. Site 1003006 - Clean 18" cmp inlet & outlet. Rock armor inlet & outlet. Dip safe outlet. Site 1003013 - Clean 18" cmp inlet & outlet. Rock armor inlet & outlet. Dip safe outlet. Site 1003013A - Construct rock dip. Rock overside to protect fill. Site 1003013B - 18" cmp. Clean inlet & outlet. Rock armor inlet & outlet. Dip safe outlet & rock armor. Site 1003013C - Clean cmp inlet & outlet. Rock armor inlet & outlet. Eliminate inside ditch. Site 1003013D - Install 18" cmp. Rock armor inlet & outlet. Maintain 30' of inside ditch. Site 1003015 - Clean 18" cmp inlet & outlet. Rock armor inlet & outlet. Dip safe outlet. *Site 1003019 - 2 Sites. Site 1 - Upgrade 18" cmp to a 24" cmp. Dip safe outlet & rock armor. Site 2 - Construct rock ford with 24" cmp in base to accommodate low to moderate stream flows. 			
COSTS			
EQUIPMENT & LABOR	Cost / hour	Hours	Cost
CAT-----	\$90.00	16	\$1,440.00
Dump Truck-----	\$55.00	74	\$4,070.00
Excavator-----	\$125.00	54	\$6,750.00
Loader-----	\$65.00	30	\$1,950.00
Pit CAT-----	\$90.00	40	\$3,600.00
Grader-----	\$75.00	11	\$825.00
MATERIALS:			
40 ft. - 24" cmp-----	\$10.00 / ft.		\$400.00
1 Band	\$16.00 / band		\$16.00
Rip Rap - 2,000 cyds			
TOTAL COST:			\$19,051.00

**SOUTH FORK - SCOTT RIVER
ROAD SEDIMENT REDUCTION PROJECT
FINAL REPORT**

ROAD SEGMENT: 1003.1 LENGTH: 0.13 miles			
DESCRIPTION OF WORK: <ul style="list-style-type: none"> • Didn't field check. • Reshape road surface for drainage by outsloping, removing outside berms, and installing rolling dips. • Maintain existing functional culverts. Clean cmp inlets, and outlets. Excavate catch basin at cmp inlets. Install safe outlet dips over cmp's. Rock armor cmp inlets and outlets with sufficient size and quantity of rock to protect fill. 			
COSTS EQUIPMENT & LABOR	Cost / hour	Hours	Cost
CAT-----	\$90.00	3	\$270.00
Dump Truck-----	\$55.00	5	\$275.00
Excavator-----	\$125.00	1	\$125.00
Loader-----	\$65.00	1	\$65.00
Grader-----	\$75.00	2	\$150.00
MATERIALS:			
TOTAL COST:			\$885.00

ROAD SEGMENT: 1003.2 LENGTH: 0.11 miles			
DESCRIPTION OF WORK: <ul style="list-style-type: none"> • Decommission Road. • Remove 2 existing cmp's. Pull back crossings to hillslope grade. • Water bar road at 25 to 50 foot intervals 			
COSTS EQUIPMENT & LABOR	Cost / hour	Hours	Cost
CAT-----	\$90.00	3	\$270.00
Excavator-----	\$125.00	2	\$250.00
MATERIALS:			
Rip rap - 40 cyds			
TOTAL COST:			\$520.00

**SOUTH FORK - SCOTT RIVER
ROAD SEDIMENT REDUCTION PROJECT
FINAL REPORT**

ROAD SEGMENT: 1003.3 LENGTH: 0.52 miles			
DESCRIPTION OF WORK: <ul style="list-style-type: none"> Reshape road surface for drainage by outsloping, removing outside berms, and installing rolling dips. Maintain existing functional culverts. Clean cmp inlets, and outlets. Excavate catch basin at cmp inlets. Install safe outlet dips over cmp's. Rock armor cmp inlets and outlets with sufficient size and quantity of rock to protect fill. Upgrade failed or eroded crossings to higher standards. <ul style="list-style-type: none"> *Site 1003009 - Failed 30" cmp. Construct large rip rap rock ford. Re-use 30" cmp and install in base of ford. Rip rap inlet & outlet. Site 1003010 - Functional 24" cmp. Clean inlet & outlet. Rock inlet & outlet. Dip safe outlet. If needed excavate large catch basin at cmp inlet. Site 1003011 - Functional 18" cmp. Clean inlet & outlet. Rock inlet & outlet. Dip safe outlet. If needed excavate catch basin at inlet. 			
COSTS			
EQUIPMENT & LABOR	Cost / hour	Hours	Cost
CAT-----	\$90.00	9	\$810.00
Dump Truck-----	\$55.00	18	\$990.00
Excavator-----	\$125.00	16	\$2,000.00
Loader-----	\$65.00	7	\$455.00
Pit CAT-----	\$90.00	15	\$1,350.00
Grader-----	\$75.00	4	\$300.00
MATERIALS:			
Rip Rap - 1,200 cyds			
TOTAL COST:			\$5,905.00

ROAD SEGMENT: 1003.4 LENGTH: 0.8 miles			
DESCRIPTION OF WORK: <ul style="list-style-type: none"> Reshape road surface for drainage by outsloping, removing outside berms, and installing rolling dips. Site 1003032 - Functional 18" cmp. Clean inlet & outlet. Rock armor inlet & outlet. Dip safe outlet. No road work to be performed past site 1003032. The road past this point shows no signs of significant erosion. The road is outsloped with very little outside berm present. Re-vegetation on the road is occurring. Corrective road work would create more impacts than what presently exists to mitigate. 			
COSTS			
EQUIPMENT & LABOR	Cost / hour	Hours	Cost
CAT	\$90.00	1	\$90.00
Grader	\$75.00	1	\$75.00
Dump Truck	\$55.00	1	\$55.00
MATERIALS:			
Rip Rap - 15 cyds			
TOTAL COST:			\$220.00

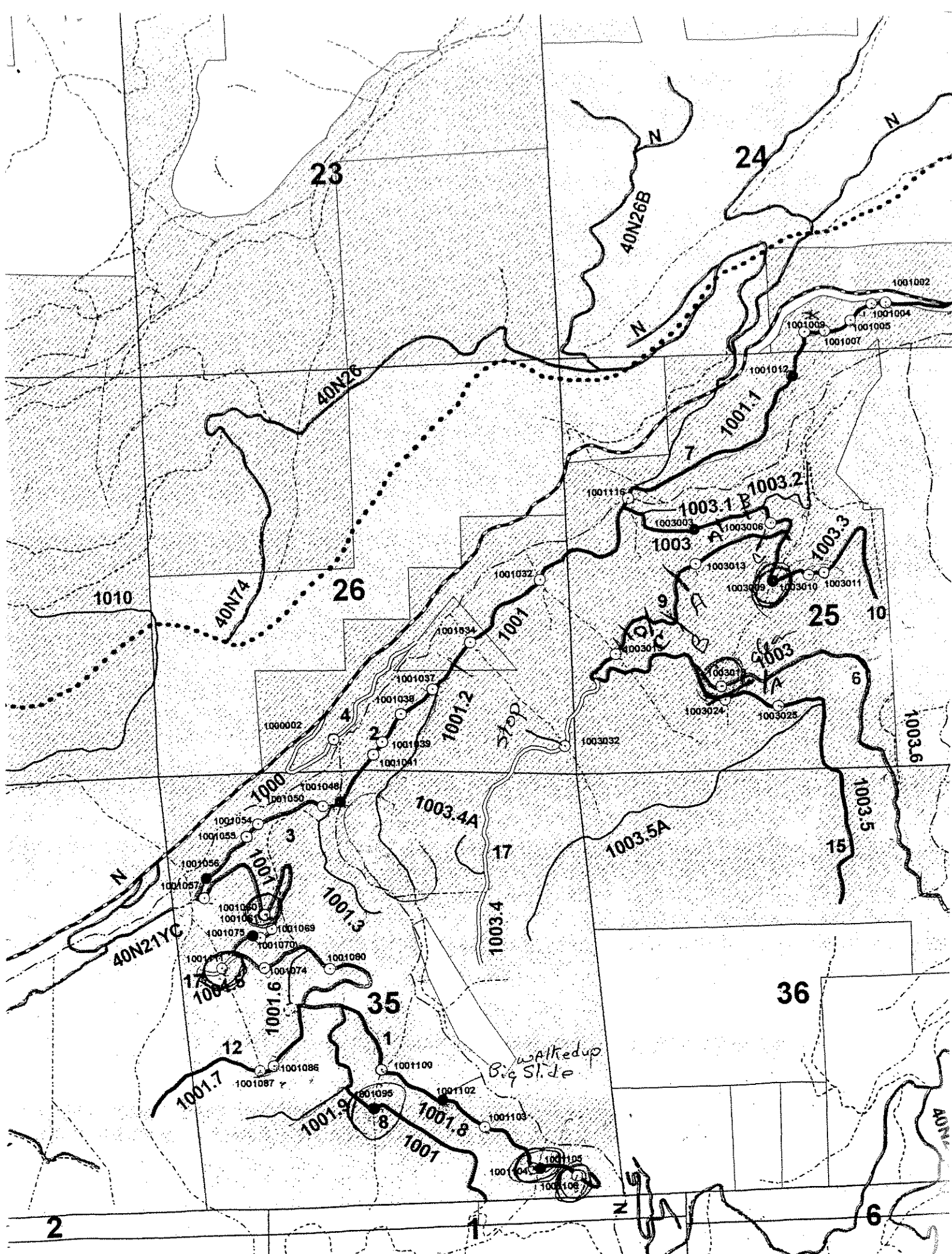
**SOUTH FORK - SCOTT RIVER
ROAD SEDIMENT REDUCTION PROJECT
FINAL REPORT**

ROAD SEGMENT: 1003.5			
LENGTH: 0.95 miles			
DESCRIPTION OF WORK:			
<ul style="list-style-type: none"> Reshape road surface for drainage by outsloping, removing outside berms, and installing rolling dips. Maintain existing functional culverts. Clean cmp inlets, and outlets. Excavate catch basin at cmp inlets. Install safe outlet dips over cmp's. Rock armor cmp inlets and outlets with sufficient size and quantity of rock to protect fill. Site 1003024 – Functional 18" cmp. Clean inlet & outlet. Rock armor inlet & outlet. Dip safe outlet. Site 1003025 – Functional 24" cmp. Clean inlet & outlet. Rock armor inlet & outlet. Dip safe outlet. <p>The inventory indicates that some erosion is taking place just down from the cmp outlet. If correctable, place rock armor where necessary.</p>			
COSTS			
EQUIPMENT & LABOR	Cost / hour	Hours	Cost
CAT-----	\$90.00	2	\$180.00
Dump Truck-----	\$55.00	7	\$385.00
Excavator-----	\$125.00	5	\$625.00
Loader-----	\$65.00	2	\$130.00
Grader-----	\$75.00	2	\$150.00
MATERIALS:			
Rip Rap – 110 cyds			
TOTAL COST:			\$1,470.00

ROAD SEGMENT: 1003.5A			
LENGTH: 0.9 miles			
DESCRIPTION OF WORK:			
<ul style="list-style-type: none"> No field checked. Inventory indicates road has been abandoned. Check road and correct for any erosion problems. 			
COSTS			
EQUIPMENT & LABOR	Cost / hour	Hours	Cost
CAT-----	\$90.00	1	\$90.00
MATERIALS:			
TOTAL COST:			\$90.00

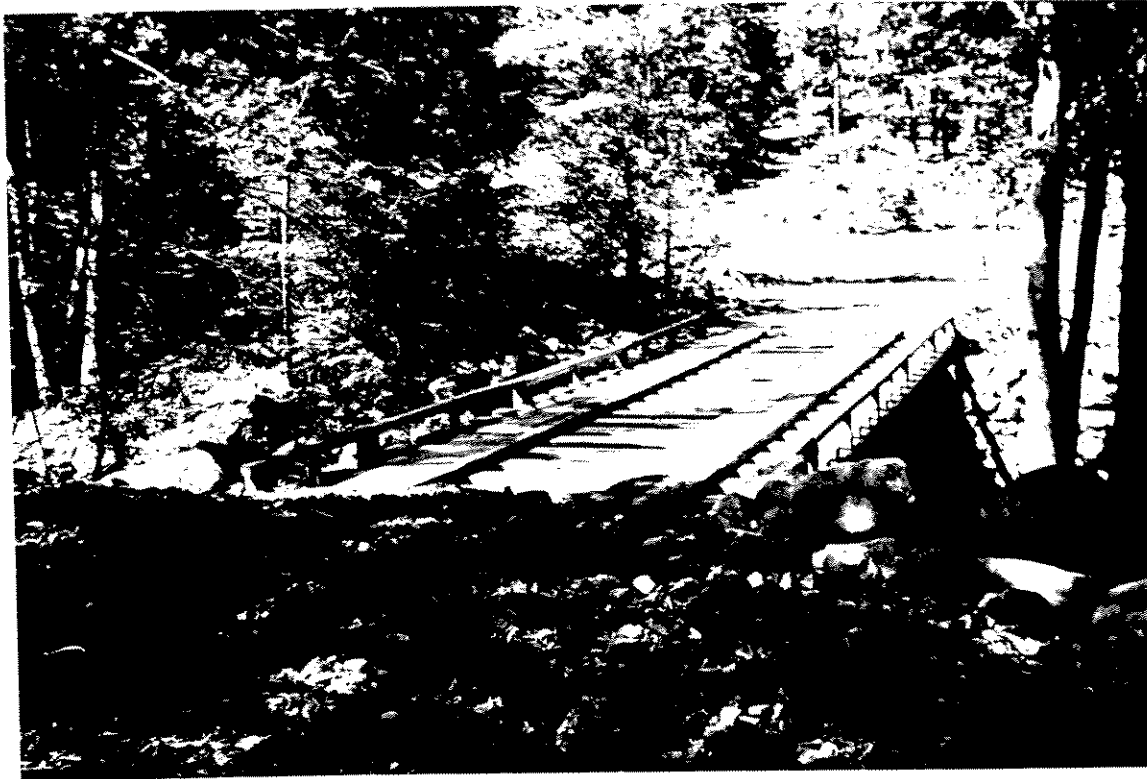
**SOUTH FORK - SCOTT RIVER
ROAD SEDIMENT REDUCTION PROJECT
FINAL REPORT**

ROAD SEGMENT: 1003.6 LENGTH: Approx. 1 mile			
DESCRIPTION OF WORK: <ul style="list-style-type: none"> Removed outside berms and outsloped road where needed. Removed 24" cmp. Rip rap crossing. 			
COSTS			
EQUIPMENT & LABOR	Cost / hour	Hours	Cost
CAT-----	\$90.00	5	\$450.00
Excavator-----	\$125.00	5	\$625.00
Dump Truck-----	\$55.00	5	\$275.00
Loader-----	\$65.00	2	\$130.00
Labor - Jute Matting-----	\$32.50	4	\$130.00
Sub Total:			\$1610.00
MATERIALS:			
Rip Rap - 70 cyds			
Jute Matting	\$125.00/roll	5 Rolls	\$625.00
TOTAL COST:			\$2235.00



APPENDIX C -- SITE PHOTOS

Road # 1001-- Site # 1001048
(Fox Creek railroad-car bridge and planking installation)



Road # 1001.8 -- Origin of decommissioned segment
(Outsloping and waterbaring, prior to seed/mulch)



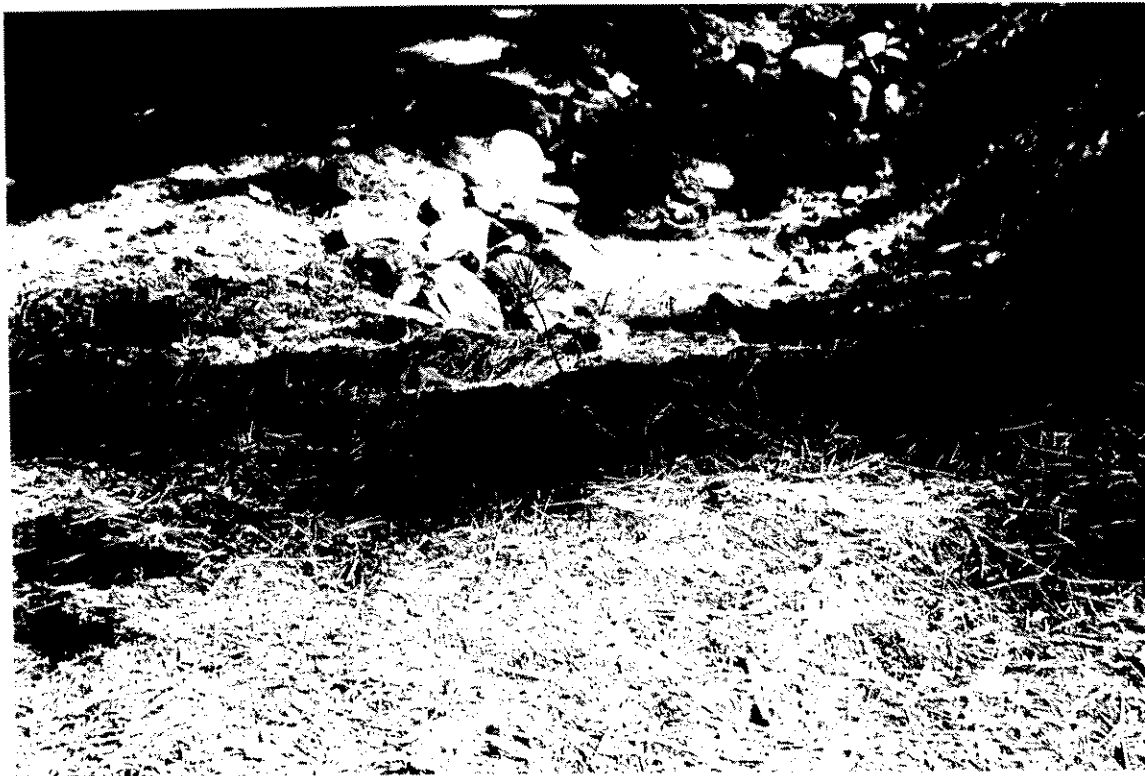
Road # 1001 -- Site # 1001075
(Rock lining and cleaning of inboard ditch above CMP)



Road # 1003.6 -- Decommissioned segment
(Barrier cloth anchoring of unconsolidated fill material)



Road # 1001 -- Site # 1001037
(Excavation, cleaning, rock armoring and mulch at CMP inlet/outlet)



Road # 1001 -- Site # 1001032
(Excavation , cleaning, rock armoring and mulch at CMP inlet)



Road # 1001.8 (Decommissioned segment) -- Sites # 1001104 and 105
(Trench and outlet construction and rocking to concentrate runoff)



Junction Roads #1001 and 1003 -- Site (uninventoried)
(Rolling dip construction and rock armoring)



Road # 1001.8 -- Site # 1001102
(Rolling dip and rock ford construction)

